

## **REMARKS**

Claim 60 has been canceled without prejudice or disclaimer. Therefore, claims 47-59 and 61-65 are pending in the present application and at issue.

It is respectfully submitted that the present amendment presents no new issues or new matter and places this case in condition for allowance. Reconsideration of the application in view of the above amendments and the following remarks is requested.

### **I. The Restriction Requirement**

The Office maintained the restriction requirement because "there is no special technical feature that is common to the groups. Specifically, the process recited in claim 47 lacks an inventive step ... and is rendered obvious by Shi et al. (U.S. Patent No. 6,054,302) in view of Walon (U.S. Patent No. 4,235,965)."

As discussed below, Shi et al. and Walon do not render obvious Applicants' claimed invention. Applicants therefore submit that the restriction requirement is improper, and respectfully request that it be withdrawn.

Moreover, claim 47 links Groups I, II and III. Therefore, upon allowance of the linking claim, the restriction requirement as to the linked inventions should be withdrawn and all claims within the linked inventions should be examined in the instant application.

### **II. The Rejection of Claim 60 under 35 U.S.C. 112**

Claim 60 is rejected under 35 U.S.C. 112 as being indefinite. Specifically, the Office objected to the recitation "the enzyme does not comprise a catalytic module." Claim 60 has been canceled without prejudice or disclaimer. Therefore, this rejection is rendered moot.

### **III. The Rejection of Claims 47-56 and 60 under 35 U.S.C. 103**

Claims 47-56 and 60 are rejected under 35 U.S.C. 103 as being unpatentable over Shi et al. (U.S. Patent No. 6,054,302) in view of Walon (U.S. Patent No. 4,235,965), as evidenced by the attached sequence alignment (Alignment 1). This rejection is respectfully traversed.

According to the Office, Shi et al. disclose a method of producing a soluble starch hydrolysate, comprising subjecting an aqueous granular starch slurry at a temperature below the initial gelatinization temperature to the action of two or more enzymes such as an alpha-amylase, beta-amylase or glucoamylase and Walon teaches a method for producing a soluble starch hydrolysate by subjecting a granular starch slurry at a temperature below its initial gelatinization temperature to a bacterial alpha amylase.

However, as the Office concedes, neither Shi et al. nor Walon teach or suggest the use of an enzyme which (i) is a member of the Glycoside Hydrolase Family 13; (ii) has alpha-1,4-glucosidic hydrolysis activity; and (iii) comprises a functional carbohydrate-binding module belonging to CBM Family 20, wherein the carbohydrate-binding module comprises an amino acid sequence having at least 90% homology to the amino acid sequence of SEQ ID NO: 2, as claimed herein.

Nevertheless, the Office states that "One of ordinary skill in the art would have been motivated to use an enzyme comprising the CBM recited in the claims because an enzyme comprising the CBM recited in the claims is an alpha amylase from a *Bacillus* spp. (see attached Alignment 1)." This is respectfully traversed.

Alignment 1 provides the results of a search in the GenCore database for references disclosing a carbohydrate binding domain having the amino acid sequence of SEQ ID NO: 2. The search identified the following eight references disclosing a carbohydrate binding domain with 100% sequence identity to SEQ ID NO: 2:

1. WO 2004/113551 (result 1)
2. WO 2005/003311 (result 2)
3. WO 2005/045018 (result 3)
4. WO 2005/069840 (result 4)
5. WO 2006/065579 (result 5)
6. WO 2007/149699 (result 6)
7. WO 2004/113551 (result 7) and
8. WO 2005/001064 (result 8).

However, all of these references published after Applicants' priority date. Therefore, these references are not prior art. Moreover, the amino acid sequence of SEQ ID NO: 2 is a carbohydrate binding domain, not an alpha-amylase.

Since neither of the cited references teaches or suggests an enzyme comprising the CBM recited in the claims, the cited references do not render obvious Applicants' claimed invention.

Applicants draw the Examiner's attention to U.S. Patent No. 7,618,795, which claims the benefit of the same U.S. provisional applications as the present application, *i.e.*, U.S. provisional application nos. 60/482,489 and 60/514,854. The '795 patent claims a process for producing a soluble starch hydrolyzate, comprising subjecting an aqueous granular starch slurry at a temperature below the initial gelatinization temperature of said granular starch to the action of an enzyme, which (i) is a member of Glycoside Hydrolase Family 13; (ii) has alpha-1,4-glucosidic hydrolysis activity; and (iii) comprises a functional carbohydrate-binding module (CBM) belonging

to CBM Family 20, which has an amino acid sequence having at least 90% homology to the amino acid sequence of SEQ ID NO: 1.

For the foregoing reasons, Applicants submit that the claims overcome this rejection under 35 U.S.C. 103. Applicants respectfully request reconsideration and withdrawal of the rejection.

#### **IV. The Rejection of Claims 47-60 under 35 U.S.C. 103**

Claims 47-60 are rejected under 35 U.S.C. 103 as being unpatentable over Shi et al. (U.S. Patent No. 6,054,302) in view of Walon (U.S. Patent No. 4,235,965), as evidenced by the attached sequence alignment (Alignment 1), and further in view of Leach (U.S. Patent No. 3,922,196). This rejection is respectfully traversed.

As discussed above, Shi et al. and Walon do not teach or suggest an enzyme comprising the CBM recited in the claims.

According to the Office, Leach teaches a method for the enzymatic hydrolysis of granular starch wherein the process may occur in the presence of a membrane, such as an ultrafiltration membrane, wherein the retentate is held in the presence of membranes and the permeate is the soluble starch hydrolysate.

However, like Shi et al. and Walon, Leach also does not teach or suggest an enzyme comprising the CBM recited in the claims.

For the foregoing reasons, Applicants submit that the claims overcome this rejection under 35 U.S.C. 103. Applicants respectfully request reconsideration and withdrawal of the rejection.

#### **V. Conclusion**

In view of the above, it is respectfully submitted that all claims are in condition for allowance. Early action to that end is respectfully requested. The Examiner is hereby invited to contact the undersigned by telephone if there are any questions concerning this amendment or application.

All required fees were charged to Novozymes North America, Inc.'s Deposit Account No. 50-1701 at the time of electronic filing. The USPTO is authorized to charge this Deposit Account should any additional fees be due.

Respectfully submitted,

Date: January 6, 2010

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